Green Economy as a driver for Urban Regeneration: insights from Greentown Labs, USA

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GREEN ECONOMY AS A DRIVER FOR URBAN REGENERATION: INSIGHTS FROM GREENTOWN LABS, USA

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Abstract: The objective of this study is to investigate the linkages between economic development, innovation and environmental sustainability inside urban areas. To achieve this goal, this paper adopts a case study strategy, by drawing inspiration from an incubator located in the Boston metropolitan area, named Greentown Labs. The case study is discussed by analysing the different stages the Greentown Labs went through, relocating from Cambridge to Boston and then from Boston to Somerville. The present contribution will give some recommendations considering the creation of incubators as facilitator of growth of innovative start-ups that can be essential for spurring innovation and economic development within urban centres.

Keywords: MAPS-LED, Greentown Labs, Sustainability, Innovation, Incubator.

1. INTRODUCTION

Innovation is a procedure that brings to a result: this result is, by definition, new in the sense that it is a thing or a way of making something that before was not there (Godin, B., 2008). Innovation is a proxy of the generation of new knowledge and it happens by means of several causes: project and engineering activities, specialization courses organized by the production divisions, interactions with customers and contractors, re-utilization of existing knowledge coming from outside the firm (Katz, J., 2004). Innovation must be distinguished from invention. Many theorists have defended this argument over the course of the years. Innovation is essential to all economic activity: it is an invention, activity, market, source of supply or business group that is not only created, but put in action, utilized or promoted by a firm (OECD, 2005).

The incubator of Greentown Labs, in Somerville, MA (USA) has an important role for the innovation, being an incubator for start-ups with the mission of enabling a vibrant community of entrepreneurs to work on their visions and to provide access to the space, funding, a prototyping lab and co-located office space and other facilities to enable start-ups to rapidly grow their networks and their companies.

MAPS LED is a European research project aimed at examining how innovation happens spatially. This project has first mapped at the urban level the most performing clusters in the Boston metropolitan area and then identified within this area the initiatives, where creation and use of innovation happen. Figure 1 shows the initiatives selected for the project. Among them, Greentown Labs has been chosen for this paper, since it is focused on the Green tech sector, or more in general on the Green Economy. The case study will be discussed by analysing all the steps of its development, exploring the different locations where Greentown Labs was placed through the years. Finally, lesson learned will be discussed, lesson transfer,

justification for the case study selected, benchmarking across indicators, possible elements of transferability, limitations and constraints.

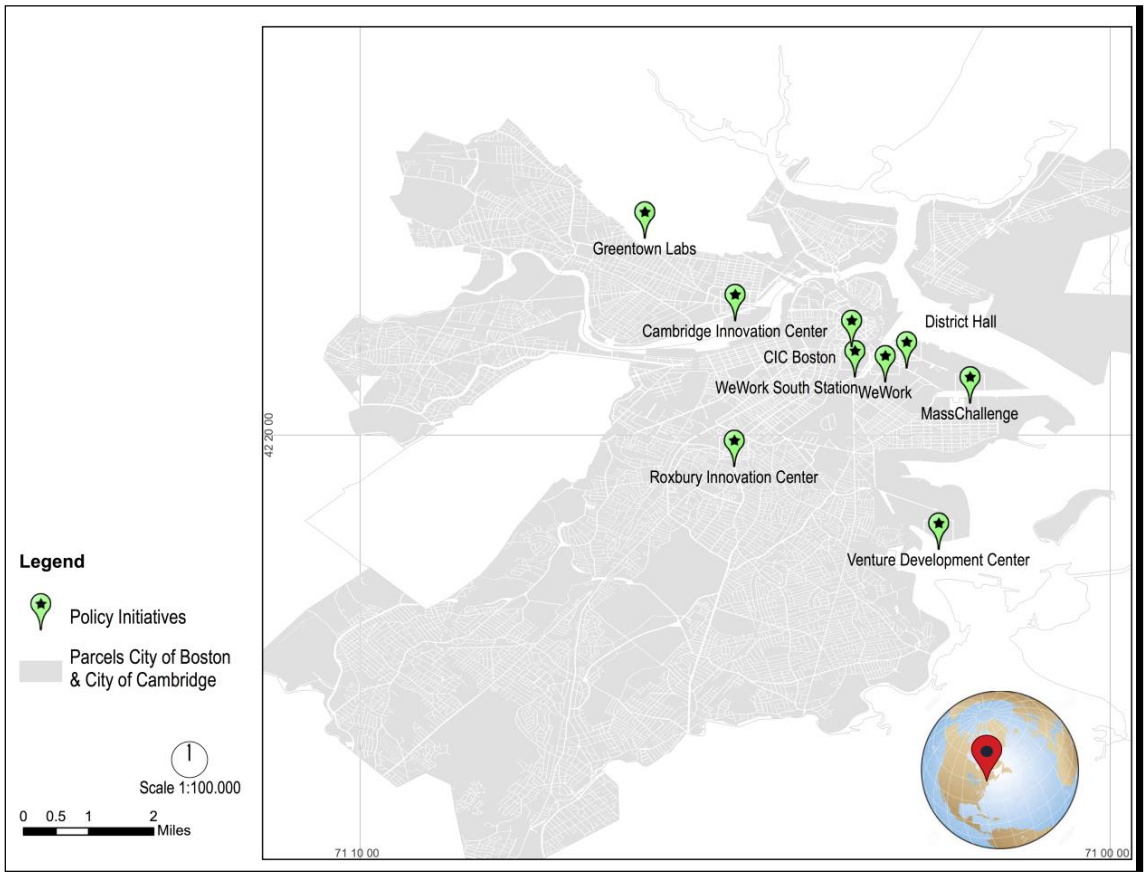

Figure 1: Selected initiatives in the Boston area

2. GREENTOWN LABS

Green Town Labs (GL) is located in Somerville, inside the Boston Metropolitan Area. The case study of Greentown Labs has been analysed under eight factors of success: Constant City Leadership, Supportive National Policy, Focus on city specific issues, Intellectual capital, Public engagement, Strong partnerships, History of global trading, Financial incentives. These eight factors of success have allowed this case study to be successful in attracting investment in the so-called "green tech" sector and in tackling key environmental challenges. Some of these factors are a result of the city's history and context, rather than having been developed exclusively for the purposes of encouraging the green tech. These factors are important for creating an ideal process to implement this sector in the city (Power, S., 2015).

Greentown Labs is an incubator for start-ups that enables entrepreneurs to solve the world's biggest energy and environmental challenges. The mission of this laboratory is to enable a vibrant community of entrepreneurs to work on their visions and to provide access to the space, resources, and funding that allows their early-stage companies to thrive. They offer 40,000 sq. ft. of prototyping lab and co-located office space, a shared machine shop, immersion in a growing community of energy and clean technology entrepreneurs, and on-

site events and programs designed to enable start-ups to rapidly grow their networks and their companies.
Most of the companies located into GL have already raised some money; they are not in their first phase. It is different than an accelerator like the other present in Boston, e.g. Mass Challenge. Companies located inside GL get some benefits from locating into the incubator, apart from knowledge sharing with other companies and casual networking, companies also get discounts for software purchasing and discount for shipping. GL does not have formal agreements with educational institutions and does not get money from them. GL has a good survival rate regarding start-ups. Among 102 total companies that have been incubated inside GL from 2011, just 18 did not make it until 2016. This means that the 82% of the companies after 5 years was still operating, and this rate is way higher than the one relative to the entire Finance/Insurance/Real Estate Industry which has in US 58% of start-ups still operating after 4 years, while the average rate of start-ups still operating after 4 years among all the industries in US is 50,5% (statisticbrain.com). To have a more general data on the average survival rate of establishments, after 5 years in US it was 56.3 % in the period 2011-2016, while the average survival rate of establishments after 4 years was 61,6% in the period 2010-2014 (Bureau of Labour Statistics, 2016). Other data say that in the U.S. the Percentage of firms that remained in operation through their first five years was 43,2 % in 2012, 45,95% in 2013 and 48,73% in 2014 (Kauffman Index, 2016).

The impact on job creation of GL is impressive, producing currently about 528 jobs. After incubating companies, the incubator tries to retain companies in Boston area, trying to struggle against the migration of the companies elsewhere, in order to keep on generating economic development in the area.

GL collaborates with several agencies and networks for improving its network and receiving funding:

- Mass Development, which is a quasi-governmental agency, supporting manufacturing in Massachusetts. Mass Development, is a state's economic development and finance agency, works with businesses, non-profits, financial institutions, and communities to stimulate economic growth across the Commonwealth. Through these collaborations they help create jobs, increase the number of housing units, revitalize urban environments, and address factors limiting economic growth including transportation, energy, and infrastructure deficiencies.
- The Department of Energy, though it does not receive any money from it.
- The Incubate Energy Network, which is accelerating the transition to a sustainable economy through national coordination of incubator resources supporting entrepreneurs focused on clean energy innovation and deployment. The network has supported more than 500 companies to date and has a significant pipeline.

2.1 The relocations of Greentown Labs

GL started as a start-up in the Kendall Square Area in 2011, and then it grew until it needed more space for developing. To fulfil its needs of more space, it moved into the Boston Seaport district, where it remained for about six months and finally relocated again into Somerville, in a vibrant and large area, seat of already existing up and coming firms.

In order to have a brief idea of the first two areas in which has been located GL, will be provided a brief description. In the Boston Seaport district there has been a huge amount of

public investments by the city of Boston in the last decade, with the intention to regenerate the area and make the district more attractive for business and foster innovation. The Kendall Square area, located in the City of Cambridge, MA, U.S.A., very close to the Massachusetts Institute of Technology (MIT), is one of the most successful international innovation hubs where the integrated approach made possible to create a development processes in social, economic, and physical terms.

Three factors mainly caused the relocation of Green Town labs from South Boston to Somerville:

1) One of the factors that caused the relocation of GL from Boston Innovation District to Somerville is the price of the land. The rent went from 8$/sq. ft. to $52/sq. ft. in the Seaport district (South Boston) in a year and a half. The median home value in 2012 in South Boston was $374,000, while in Somerville in 2012 was $362,000 (Zillow.com). Now in 2017, the average office space price for sale in the neighbourhood of South Boston is about $ 650/ sq. ft. while in the city of Somerville is $ 535/ sq. ft. (Officespace.com). The Commercial Real Estate average rental rate now in South Boston is almost $37/ sq. ft., while in Somerville is $32/ sq. ft. (Loopnet.com). This means that still there is a gap in the real estate market between the two areas.

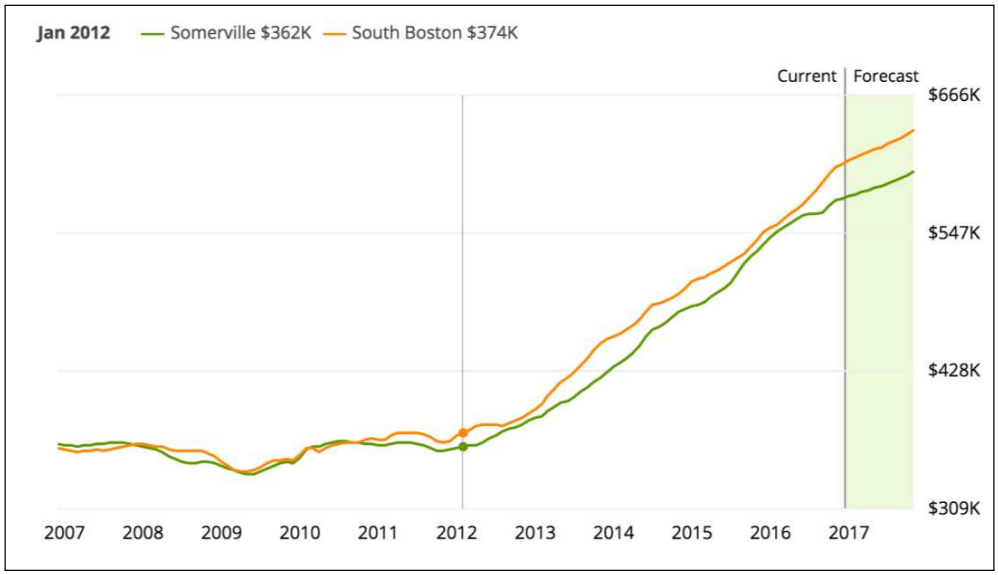

Figure 2 - Median listing price comparison between Somerville (green curve) and South Boston (orange curve). Source: http://www.zillow.com/somerville-ma/home-values/

2) Another important factor that emerged from qualitative research carried out by means of interviews was the investment into innovation done by the city of Somerville through "SomerVision", the local plan utilized by the city for the economic development of the area in the long run. It was a flexible document about the new economy, encouraging the growth.

3) The last factor that caused the relocation of the incubator into Somerville was the intention from the city of moving the laboratories much closer to the places where the young professional lived, since the creative class that worked into the incubator stayed in Somerville. By relocating GL into the community, the intention from the city was to create a vibrant community, much more liveable for the workers, that in this way had the possibility to commute to work in shorter time, by walking or bicycling.

At that time, next to the location where GL would have moved, Artisan Asylum was located, a non-profit community fabrication centre including workspaces for local craftsmen. On the other side, there was Brooklyn Boulders, a community space for climbers. The warehouse was a former envelops factory.

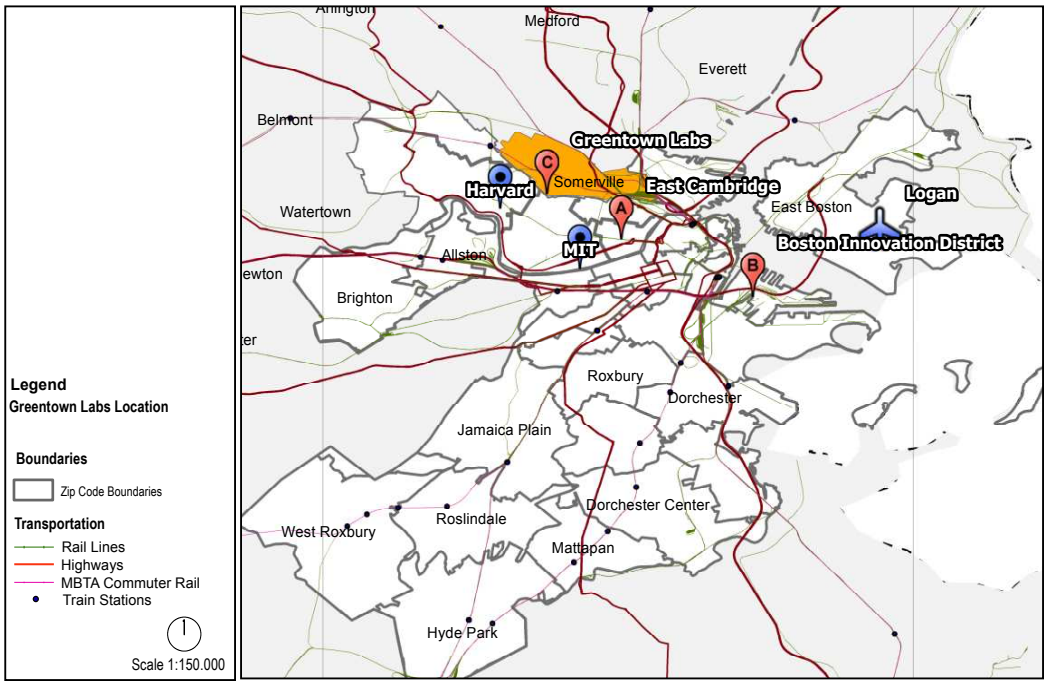

Figure 3 - Greentown Labs Locations over the years: A (Cambridge), B (Boston Innovation District) and C (Somerville)

3. DISCUSSION

In this section it will be analysed the lessons learned from the GL case study, the lessons transfer, the justification of the case study selected for lesson transfer and the possible elements of transferability, limitations and constraints.

In terms of lessons learned from the GL case study, it can be highlighted that the presence of an incubator related to a growing sector like the green tech can work as an attractor for investments, both at the local level and at the national level. The success of this initiative has been favoured also by the presence of significant anchor institutions such as important universities like the MIT and Harvard. These two universities, with the other universities present in the Boston area, played a key role not only because of the high supply of skilled and educated workforce which they furnish, but also because of their essential role in the local community and their strategic influence to the local economy and the consistent relationship which they form together with the local government and the philanthropic sector.

In terms of lesson transfer, the analysis will be conducted by referring to Rose (1991), i.e. under what circumstances and to what extent can a programme that is effective in one place transfer to another.

Moreover, Rose (2005) proposed ten steps that policy makers could undertake in order to deduce lessons from foreign experience:

1) Learn the key concepts;
2) Catch the attention of policymakers;
3) Scan alternatives and see where to look for policy lessons;
4) Learn by traveling abroad;
5) Theorize a generalized model of how a program or policy works;
6) Turn the model into a lesson fitting your own national context;
7) Decide whether is a good lesson and if it should be implemented;
8) Decide whether the lesson should be applied;
9) Simplify the means and conclusions for a greater chance of succeeding;
10) Evaluate a lesson's outcome prospectively as it evolves over time.

Policymakers can draw lessons from the GL. The collaboration among different actors and stakeholders can be taken into account as a positive example for lagging regions. The fertile innovation ecosystem present in the Boston area has favoured the rise of several innovation hubs, like GL. The justification of the choice of the GL is briefly explained. This is an exploratory study and implements a case study research of a green tech incubator and it helps in the process of decisions making for the implementation of innovation hubs and incubators in lagging regions, trying to draw possible elements that can be transferred and less positive elements that should be analysed more in depth before being transferred in lagging regions.
The benchmarking process across the context indicators of the two cases consists of comparing indicators and it can be used as a tool to understand if GL can be considered as a positive case study.

In the period 2011-2016 the 82% of the companies incubated in GL after 5 years was still operating. This survival rate of the companies is impressive if compared with the U.S. average rate of start-ups still operating after 4 years among all the industries, which is 50,5%, and with the average survival rates of establishments in the U.S., which was 61,6% in the period 2010-2014. In Europe the average survival rate of firms after 4 years in the period 2010-2014 was 50,6%, while in Italy the survival rate for companies after 4 years in 2014 was 50% in the same period (Eurostat, 2017). These data show that the survival rate for firms in Europe and in Italy are lower than the U.S. average and way lower than the Greentown Labs survival rate. The higher survival rate of firms incubated can represent a success factor due to a better supply of services for the firms inside the incubator, and a better source of investments for entrepreneurs who decided to place their firm inside an incubator in the green tech sector.

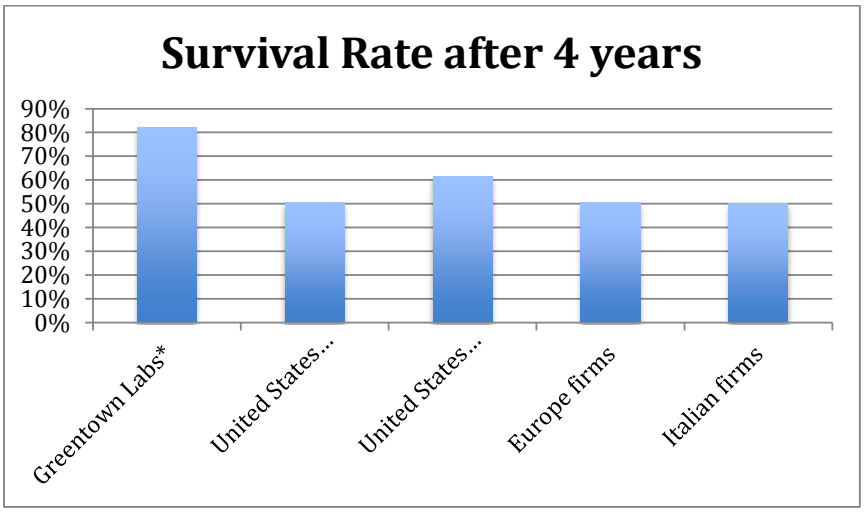

*Figure 4 – Survival rate of start-ups incubated into Greentown Labs vs. survival rate of U.S. start-ups, U.S. establishments, European firms and Italian firms (Bureau of Labour Statistics, 2017; Eurostat; Istat; Statisticbrain.com) *For Greentown Labs the survival rate is calculated after 5 years*

Another indicator for the benchmarking is the entrepreneurship level. The success of GL can be explained also as the effect of a high level of entrepreneurship in the United States in general, advantaged by all the aforementioned factors. The United States have the highest Global Entrepreneurship Index, resulting first in the 2017 Global Entrepreneurship Index rankings, which considers data on entrepreneurial attitudes, skills and aspirations of the local population. This resulted in a GEI Score of 83,4 for the U.S. versus lower GEI Scores for all the other countries, comprising European countries from Switzerland (GEI score 78) to Bulgaria (GEI score 22,7) (GEDI, 2017). Moreover, it has to be taken into account an historical American tendency to entrepreneurship.

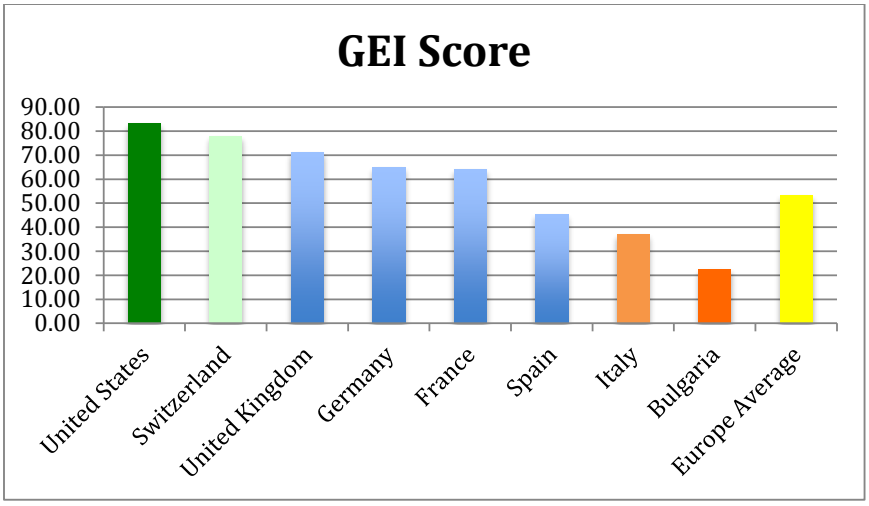

Figure 5 – Global Entrepreneurship Index in the United States and Europe - Author's elaboration based on GEDI, 2017

The installation of more incubators like GL could spur the entrepreneurship level and the number of start-ups in lagging behind regions, especially in a growing sector like the green tech. This kind of incubators work well if there is a highly educated workforce and if there is

the presence of anchor institutions. To some extent the presence of incubators or accelerators could exploit the high number of educated people in lagging regions, functioning also as a brake to the persistent phenomenon of out-migration, which is strangling some lagging regions like the European peripheral regions.

In order to understand the possible elements of transferability of the model in a different context like the one of lagging behind regions, the Italian start-ups environment will be analysed. Following this rationale, we do not assume a policy or an investment in a specific sector to be transferred like an emulative process from one place to another without social and historical background, and institutions being taken into account.

In Italy, at the end of September 2016, the number of innovative start-ups (entered in the special section of the Register of Companies in accordance with Decree-Law 179/2012) amounted to 6,363 with an increase of 420 units respect to the end of June (+7,07%). Start-ups represent 0.4% of the Million and a half active capital companies. Moreover, in Italy at the end of June the incidence of the phenomenon was equal to 0.38%, while it represented a 0.35% in March (Union Camere et al., 2016).

These data show how an innovation led entrepreneurial ecosystem is growing according to national wide indicators, although important gaps are still existing among the North and the South of the nation, where the lagging regions are mostly located, both in terms of economy and innovation. For example, the total share of start-ups of the Southern regions and Islands (Campania, Basilicata, Puglia, Calabria, Sicily and Sardinia) does not even reach the National share of start-ups of Lombardy region alone, which is by far the most innovative region (20,27% of the south versus 21,82% of Lombardy) (Union Camere et al., 2016).

Distribuzione e densità regionale - Classifica delle regioni

Classifica	Regione	Valore assoluto	% rapporto sul totale nazionale startup	% rapporto sul totale societa' di capitale della regione
1	LOMBARDIA	1122	21,82	0,35
2	EMILIA-ROMAGNA	578	11,24	0,53
3	LAZIO	501	9,74	0,19
4	VENETO	384	7,47	0,33
5	PIEMONTE	357	6,94	0,49
6	CAMPANIA	309	6,01	0,21
7	TOSCANA	302	5,87	0,30
8	SICILIA	245	4,76	0,28
9	MARCHE	239	4,65	0,63
10	PUGLIA	200	3,89	0,25
11	TRENTINO-ALTO ADIGE	176	3,42	0,95
12	FRIULI-VENEZIA GIULIA	137	2,66	0,58
13	SARDEGNA	137	2,66	0,41
14	CALABRIA	117	2,27	0,37
15	ABRUZZO	112	2,18	0,34
16	LIGURIA	85	1,65	0,27
17	UMBRIA	76	1,48	0,37
18	BASILICATA	35	0,68	0,34
19	MOLISE	20	0,39	0,31
20	VALLE D'AOSTA	11	0,21	0,48

Figure 6 - Number of start-ups per region in Italy and regional density - regional ranking. (Union Camere et al., 2016)

Possible element of transferability can be represented by the collaboration among all the different actors, so as to create a vibrant innovation ecosystem that can favour the growth of several business and innovation hubs. The success of GL in the Boston area would not have been possible without a cooperative environment among anchor institutions, local government, third sector and private investors.

In order to understand where it is possible to find resources for the implementation of innovation hubs, the potential of some European Funds will be assessed, by considering the Calabria region as a sample amongst lagging behind regions. Some important actions can be undertaken at local level by means of European Structural Funds, coordinated by the region.

The European Regional Development Fund (ERDF), in the framework of the cohesion policy, in furtherance of the economic growth and attractiveness of the regional territory, represents the principal investment instrument of the European Union. The targets arranged by the Europe 2020 strategy are Job creation, competitiveness between enterprises, economic growth, sustainable development and improvement of the quality of life of citizens. For the 2014-2020 period, almost one third of the EU investments, amounting to 352 billion euro, are dedicated to this strategy, which is applied by means of three principal funds: European Regional Development Fund, European Social Fund, Cohesion Fund which, in common with European Agricultural Fund for Rural Development and European Fund for Maritime Affairs and Fisheries, compose the EU Structural & Investment Funds. European Regional Development Fund (ERDF) intends to reinforce regional economic and social cohesion, by subsidizing projects to increase competitiveness and generate jobs. ERDF invests also in integration projects among member nations, with the European territorial collaboration.

Within the axis 1, the objective 1.1 has the goal of increasing the companies' innovation activities, especially increasing the indicator of researchers working in enterprises in the total number of employees, representing the specialization rate of the lagging regions. In 2012 the indicator was the 0,05%, and has to increase to the target value of 0,32% by 2023 (Regione Calabria, 2015).

Another important action is the Action 1.4.1, which aims at supporting the creation and consolidation of innovative start-ups-intensive application of knowledge and the spin-offs of research initiatives. This action supports the development and qualification of the regional production system through the promotion and creation of innovative enterprises (spin off of the research, innovative start-ups and micro-enterprises), in S3 innovation areas. This action aims at increasing the incidence of innovative specialization in application perimeters with high knowledge intensity. The actions of the European development funds have the objective of increasing the indicators. In particular, the action 1.4.1 aims at increasing the indicator of the birth rate of enterprises in knowledge-intensive sectors. This indicator is rather low in Calabria, if compared to other southern Italy regions. It was 10,6% in 2011 (Istat data) and by means of European Funds it is intended to rise to 18% by 2023 according to the Regional plan.

4. CONCLUSIONS

The case study of GL has shown how the cooperation among different actors such as innovation spaces, governmental agencies, non-profits, and private investors can bring more people to participate to the innovation process, inside a growing sector like the green tech. The case study has revealed also that innovation centres, incubators, and co-working spaces can increase the innovation level and the employment within urban areas, if there are some favourable conditions promoted by the implementation of the right actions in the right time in the right locations.

All the urban processes and actors involved can be summed up in a term: Innovation Ecosystem (IE). The IE is defined as the assorted array of members and capitals that contribute to and are essential for on-going innovation in a contemporary economy (World Economic Forum, 2016). GL represents a space where all the aforementioned actors converge and can meet in order to share knowledge, create innovation and contribute to economic growth. These innovative structures embedded within the urban framework, can increase the level of engagement of people, who can be empowered to actively participate by means of a collaborative innovative process, helping to leverage the innovation capacity.

The presence of an incubator in a growing sector like the green tech can work as an attractor for investments, both at the local level and at the national level. The success of this initiative has been favoured also by the presence of significant anchor institutions such as important universities like the MIT and Harvard. These two universities, with the other universities present in the Boston area, played a key role not only because of the high supply of skilled and educated workforce which they furnish, but also because of their essential role in the local community and their strategic ability to influence to the local economy and the consistent relationship with the local government and the philanthropic sector. GL also mirrors the high level of entrepreneurship in the Boston area, advantaged by all the aforementioned factors. Reasonably, the presence of incubators or accelerators could also take advantage of the high number of educated people in lagging behind regions, working as a brake to the persistent phenomenon of out-migration, which is suffocating some lagging regions like the European peripheral regions.

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6. REFERENCES

Bureau of Labour and Statistics, 2016. Entrepreneurship and the U.S. Economy. Chart 3. Survival rates of establishments, by year started and number of years since starting. [online] Available at: https://www.bls.gov [Accessed June 2017]

Eurostat, 2017. Business demography by size class (from 2004 onwards, NACE rev.2). [online] Available at: http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do [Accessed June 2017]

GEDI, 2017. Global Entrepreneurship Index. [online] Available at: https://thegedi.org [Accessed June 2017]

Godin, B., 2008. Innovation: the History of a Category. Project on the Intellectual History of Innovation Working Paper, 1.

Istat. Rate of enterprises in knowledge-intensive sectors. [online] Available at: https://www.istat.it [Accessed October 2016].

Katz, J., 2004, May. Industrial Dynamics, Innovation and Development. In druid Summer Conference, Denmark.

Kauffman index, 2016. Survival rate. [online] Available at: http:// http://www.kauffman.org/ [Accessed June 2017]

Loopnet. Somerville Commercial Real Estate for Sale and Lease - Somerville, Massachusetts and South Boston Commercial Real Estate for Sale or Lease. [online] Available at: https://www.loopnet.com [Accessed June 2017]

MAPS-LED, 2017. S3: Cluster Policy & Spatial Planning. Deliverable 2.2 Knowledge Dynamics, Spatial Dimension and Entrepreneurial Discovery Process. Available at: http://www.cluds-7fp.unirc.it/about-maps-led.html

OECD, 2005. Oslo manual: The measurement of scientific and technological activities. Paris: Organisation for Economic Co-operation and Development.
Office Space. Somerville, MA Office Prices and South Boston, MA Office Prices. [online] Available at: https://www.officespace.com [Accessed June 2017]
Power, S., Cousin, A., England, S., & Brown, C., 2015. Greentech in the City Whitepaper. A roadmap based on seven cities. [online] Bristol: Arup. Available at: http://publications.arup.com/publications/g/greentech_in_the_city_whitepaper [Accessed September 2016].
Regione Calabria, 2015. Programma Operativo Regionale 2014-2020. Fondo Europeo di Sviluppo Regionale Fondo Sociale Europeo. [online] Available at: http://www.regione.calabria.it [Accessed May 2017]
Rose, R., 1991. "What is Lesson-Drawing?," Journal of Public Policy. Cambridge University Press, 11(1), pp. 3–30. doi: 10.1017/S0143814X00004918.
Rose, R., 2005. Learning from Comparative Public Policy: A practical guide. London, Routledge.
Statistic Brain, 2017. Startup Business Failure Rate By Industry. [online] Available at: http://www3.statisticbrain.com [Accessed May 2017]
Union Camere, Ministero dello Sviluppo Economico & Info Camere, 2016. Cruscotto di Indicatori Statistici. Available at: http://startup.registroimprese.it/report/3_trimestre_2016.pdf [Accessed December 15, 2016].
World Economic Forum, 2016. China's Innovation Ecosystem. [online] Available at: http://www3.weforum.org [Accessed March 2017]
Zillow. Home prices in Somerville and South Boston. [online] Available at: http://www.zillow.com/somerville-ma/home-values/ [Accessed September 2016]